Product Name :	**Product Code :**
PC Control System and Control Software	CHINAELABC2750042

Description :

Static Cum Dynamic Rock Triaxial Testing System - PC Control System and Control Software

Technical Specification :

Control system provides the digital servo control, Wave generation for the axial loading, data acquisition, hydraulic control etc. for the continuous operation of the system.
Signal Conditioning & Controlling Unit Servo controller basically consists of signal conditioning unit and controlling unit. Signal conditioning unit consists of conditioning modules for various transducers (e.g. Load Cell, Displacement Transducers etc.) that receives the output signal from these sensors and amplifies and process that signal as per the requirement and transfer it to computer through dedicated cables where it is accepted by the data acquisition system. The out put from the signal conditioning unit for each transducers range from 0-5V.The controlling unit controls the movement of the RAM with respect to the signal input on feed back basis either from LOAD CELL or DISPLACEMENT sensor.

It consists of dedicated servo-controller card that gives the desired processed signal through the P.I.D controller to the servo valve to operate either of the control modes i.e. Load mode or Displacement mode. It also sends the signal to computer and accepts the command from the software to operate in desired manner. The system can generate sine, triangular or square wave form and also can accept external input wave form as generated in the field. The programming facility is given to operate the system in STATIC MODE at programmed rate of loading in both Load and Displacement controls. In DYNAMIC MODE the cycling can be done at a frequency from 0.01Hz-10Hz or even higher.

Specifications of Controller
Auto PID operation with auto loop shaping servo operation
Closed loop update rate is 10 kHz

No. of control channels- 2 (Load/Displacement)

Demand Wave generation – Sine, Triangular, Square, Random wave forms and Ramp signal

High speed Data Acquisition card with 100 kHz sampling rate and 16-bit resolution acquires data from the signal conditioning and controlling unit

System accuracy – Load accuracy : ±0.5% of indicated value of Load Displacement accuracy: ± 0.5% of indi cated value

Two types of Loading – Dynamic (for fatigue test) and Static (Ramp)

Dynamic Frequency Range – 0.01Hz to 10Hz or even higher (Note: The stroke of actuator depends upon the frequency of operation. Performance curve will be provided along with the offer)

Static Ramp rate: Load control mode – 1kN/sec – 10kN/sec Displacement control mode- 0.001mm/sec – 2mm/sec.

Environmental Temperature – 0OC to + 60OC

Relative Humidity – 10% to 85% noncondensing

Supply Input – 220-240 VAC, 50 Hz

Computer for Controlling and Data acquisition System is provided with dedicated computer of latest available configuration with built in data
acquisition card and wave generator.

Data acquisition card

The PCI Bus advanced data acquisition card provides the following advanced features

32 bit PCI- bus

16-bit Analog Input resolution (Higher bit resolution up to 24bit)

Auto Scanning Channel selection up to 16 channels.

Up to 100 KHz A/D Sampling Rates

16 Single ended Analog Input channels

Bipolar Input signals

Programmable gain of x1, x2, x4, x8, x16

Input range: +/-10V, +/-5V, +/-2.5 V, +/- 1.25V, +/-0.625V

One 12-bit Monolithic multiplying Analog Output channel

16 Digital Output and 16 Digital Input channels

4 extended Digital Input and Digital Output channels on the 37 – pin con nector

3 Independent programmable 16-bit down| counters.

Three A/D Trigger modes: Software Trigger, Programmable Pacer Trigger and External Pulse Trigger

Pre-trigger control

Internal DC-to-DC converter for stable Analog power source.

CONTROL SOFTWARE

Controlling and On-line Data Acquisition to PC through user friendly software and Statistical Analysis of the results obtained.

Salient Features

Windows based user friendly software

Capable of testing Triaxial Test, Unconfined, Indirect Tensile, Creep Tests and normal Compression Tests on Rock specimen up to NX size in both Cyclic (Frequency Range-0.01Hz-10Hz) and Routine Static testing

Four different types of axial loading can be given to the sample- Sine, Square, Triangle and Ramp signal

Programmable Loading parameters – Frequency, Base, Amplitude etc.

Programmable rate of loading in Static Tests

Programmable cell pressure and automatic controlling of cell pressure

Computer/Software programmable Safety Limits for each load & displacement

Independent Taring of each channel

Facility to hold the loading and restart loading during the test.

Shows number of cycle on screen
Store the number of cycles in Dynamic test
Real time display of Load v/s Displacement, Load v/s Time & Displacement v/s Time graphs
On-line display of load, displacement and Confining pressure
Auto adjustment of graph scales

Analysis Software
Plotting of following graphs a Load v/s Time
Displacement v/s Time
Load v/s Displacement
Stress v/s Strain
Calculation of various results (Young's modulus, Maximum strain, Compressive Strength etc.)
Facility to plot the data for a selected run
Comparative analysis using multi graphs
Statistical analysis of the test results
Batch Summary Report
Detailed Summary Report
Advance Statistical Analysis
Facility to print Test Reports
Facility to Export Data to MS Excel

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